Amendments to the Claims:

Listing of Claims:

1. (Currently amended) A method for routing a liquid comprising the steps of:

receiving said liquid on a patterned surface having an open architecture comprising one or more surface pathways; and

individually activating one or more heating elements,

wherein said heating elements are in registry with said patterned surface for selectively heating said patterned surface under conditions effective for preventing or promoting migration of said liquid along said one or more surface pathways, said surface pathways being either (1) a flat topology with chemical patterning or (2) an indentation, ridge or groove ~~optionally~~ said indentation, ridge or groove having chemical patterning and flow of said liquid is by thermocapillary shear stresses and said liquid remains in constant contact with a gaseous phase.

2. (Previously presented) The method of claim 1 wherein each of said one or more surface pathways connect a source reservoir to a target reservoir.

3. (Previously presented) The method of claim 1 comprising a plurality of said surface pathways, each of said pathways connect a source reservoir to a target reservoir.

4. (Previously presented) The method of claim 1 wherein said surface pathways form a network including a first plurality of said surface pathways each having a source reservoir and a target reservoir and a second plurality of said surface pathways each having a source reservoir and a target reservoir, said first plurality of surface pathways being interconnected to said second plurality of surface pathways.

5. (Previously presented) The method of claim 1 further comprising a plurality of first said surface pathways connected perpendicularly to a second surface pathway, each of said first surface pathways and said second surface pathway having a source reservoir and a target reservoir.

6. (Previously presented) The method of claim 1 wherein a plurality of said surface pathways are arranged radially from a source reservoir to a plurality of target reservoirs or radially from a plurality of source reservoirs to a target reservoir.

7. (Previously presented) The method of claim 1 wherein said surface pathways are rectilinear.

8. (Previously presented) The method of claim 1 wherein said surface pathways are curvilinear.

9. (Previously presented) The method of claim 1 wherein said surface pathways are sinuous.

10. (Original) The method of claim 1 wherein each of said heating elements are associated with a cell, said cell including at least one transistor, said transistor being activated for activating said heating element of said cell.

11. (Original) The method of claim 10 wherein said cells are arranged in a matrix array.

12. (Previously presented) The method of claim 10 wherein each of said one or more surface pathways connects a source reservoir to a target reservoir and one said heating elements is used for heating or cooling said source reservoir.

13. (Original) The method of claim 1 wherein said patterned surface is formed on a substrate and said heating elements are associated in registry with said substrate.

14. (Original) The method of claim 13 wherein a thermal insulation layer is coupled to an upper surface of said substrate and a bottom surface of said one or more heating elements.

15. (Original) The method of claim 13 wherein an electrical insulation layer is coupled to an upper surface of said substrate and a bottom surface of said one or more heating elements.

16. (Original) The method of claim 13 wherein an electrical insulation layer is coupled to an upper surface of said one or more heating elements.

17. (Original) The method of claim 13 further comprising a passivation layer coupled to said substrate.

18. (Original) The method of claim 13 further comprising a planarization layer coupled to said one or more heating elements.

19. (Original) The method of claim 13 wherein said one or more heating elements are coupled to a first region of said substrate and a heat sink is coupled to a second region of said substrate.

20. (Original) The method of claim 1 wherein said activated one or more heating elements form a thermal map.

21. (Original) The method of claim 20 wherein said liquid is a continuous stream and activation of said thermal map divides said stream into a series of droplets.

22. (Original) The method of claim 21 wherein said droplets have equal size or unequal size.

23. (Original) The method of claim 20 wherein said liquid is one or more droplets and activation of a first said thermal map traps said one or more droplets.

24. (Original) The method of claim 20 wherein application of a second thermal map releases said trapped one or more droplets.

25. (Original) The method of claim 20 wherein activation of said thermal map initiates a reaction.

26. (Original) The method of claim 20 wherein activation of said thermal map quenches a reaction.

27. (Original) The method of claim 1 wherein said patterned surface comprises one or more hydrophobic portions confining a hydrophilic surface, wherein said liquid flows along said hydrophilic surface.

28. (Previously presented) The method of claim 1 wherein a first said liquid is received in one of said surface pathways and a second said liquid is received in another of said surface pathways, said surface pathways being interconnected, wherein flow of said liquid in said surface pathways mixes said first said liquid and said second said liquid.

29. (Previously presented) The method of claim 28 wherein first said one or more heating elements apply a thermal gradient transverse to said surface pathways.

30. (Previously presented) The method of claim 28 wherein second said one or more heating elements apply a thermal gradient parallel to said surface pathways.

31. (Original) The method of claim 1 wherein an airborne material in gaseous, particulate or aerosol form is absorbed in said liquid and further comprising the step of:

detecting said absorbed material.

32. (Original) The method of claim 31 wherein said material is detected by fluorescence of said liquid upon contact with said material.

33. (Original) The method of claim 1 further comprising the step of:

storing said patterned surface in glycerol.

34. (Original) The method of claim 1 further comprising:

applying a layer of glycerol on said patterned surface.

35. (Original) The method of claim 27 further comprising:

applying a layer of glycerol on said hydrophilic surface.

36. (Currently amended) A device for routing a liquid comprising:

a patterned surface receiving said liquid, said patterned surface having an open architecture comprising one or more surface pathways;

one or more heating elements in registry with said patterned surface; and

means for individually activating one or more of said one or more heating elements, to selectively heat said patterned surface under conditions effective for preventing or promoting migration of said liquid along said surface pathways, said surface pathways being either (1) a flat topology with chemical patterning or (2) an indentation, ridge or groove ~~optionally~~ said indentation, ridge or groove having chemical patterning and flow of said liquid is by thermocapillary shear stresses and said liquid remains in constant contact with a gaseous phase.

37. (Previously presented) The device of claim 36 wherein each of said surface pathways connect a source reservoir to a target reservoir.

38. (Previously presented) The device of claim 36 further comprising a plurality of said surface pathways, each of said surface pathways connect a source reservoir to a target reservoir.

39. (Previously presented) The device of claim 36 wherein said pathways form a network including a first plurality of said surface pathways each having a source reservoir and a target reservoir and a second plurality of said surface pathways each having a source reservoir

and a target reservoir, said first plurality of said surface pathways being interconnected to said second plurality of said surface pathways.

40. (Previously presented) The device of claim 36 further comprising a plurality of first surface pathways connected perpendicularly to a second surface pathway, each of said first surface pathways and said second surface pathway having a source reservoir and a target reservoir.

41. (Previously presented) The device of claim 36 wherein said surface pathways are arranged radially from a source reservoir to a plurality of target reservoirs or from a plurality of source reservoirs to a target reservoir.

42. (Previously presented) The device of claim 36 wherein said surface pathways are rectilinear.

43. (Previously presented) The device of claim 36 wherein said surface pathways are curvilinear.

44. (Previously presented) The device of claim 36 wherein said surface pathways are sinuous.

45. (Original) The device of claim 36 wherein each of said heating elements are associated with a cell, said cell including at least one transistor, said transistor being activated for activating said heating element of said cell.

46. (Original) The device of claim 36 wherein said cells are arranged in a matrix array.

47. (Previously presented) The device of claim 36 wherein each of said surface pathways connects a source reservoir to a target reservoir and one said heating element is used for heating or cooling said source reservoir.

48. (Original) The device of claim 36 wherein said patterned surface is formed on a substrate and said heating elements are associated in registry with said substrate.

49. (Original) The device of claim 48 wherein a thermal insulation layer is coupled to an upper surface of said substrate and a bottom surface of said heating elements.

50. (Original) The device of claim 48 wherein an electrical insulation layer is coupled to an upper surface of said substrate and a bottom surface of said heating elements.

51. (Original) The device of claim 48 wherein an electrical insulation layer is coupled to an upper surface of said heating elements.

52. (Original) The device of claim 48 further comprising a passivation layer coupled to said substrate.

53. (Original) The device of claim 48 further comprising a planarization layer coupled to said one or more heating elements.

54. (Original) The device of claim 48 wherein said one or more heating elements are coupled to a first region of said substrate and a heat sink is coupled to a second region of said substrate.

55. (Original) The device of claim 48 wherein said activated one or more heating elements form a thermal map.

56. (Original) The device of claim 55 wherein said liquid is a continuous stream and activation of said thermal map divides said stream into an array of droplets.

57. (Original) The device of claim 56 wherein said droplets have equal size or unequal size.

58. (Original) The device of claim 55 wherein said liquid is one or more droplets and activation of said thermal map traps said one or more droplets.

59. (Original) The device of claim 58 wherein application of a second thermal map releases said trapped one or more droplets.

60. (Original) The device of claim 55 wherein activation of said thermal map initiates a reaction at one or more of said heating elements.

61. (Original) The device of claim 55 wherein activation of said thermal map quenches a reaction at said one or more heating elements.

62. (Original) The device of claim 36 wherein said patterned surface comprises one or more hydrophobic portions confining a hydrophilic surface, wherein said liquid flows along said hydrophilic surface.

63. (Previously presented) The device of claim 36 wherein a first said liquid is received in one of said surface pathways and a second said liquid is received in another of said

surface pathways, said surface pathways being interconnected wherein flow of said liquid in said surface pathways mixes said first said liquid and said second said liquid.

64. (Previously presented) The device of claim 63 wherein first said one or more heating elements apply a thermal gradient transverse to said surface pathways.

65. (Previously presented) The device of claim 63 wherein second said one or more heating elements apply a thermal gradient parallel to said surface pathway.

66. (Original) The device of claim 36 wherein an airborne material in gaseous, particulate or aerosol form is absorbed in said liquid and further comprising:

means for detecting said absorbed material.

67. (Original) The device of claim 66 wherein said material is detected by fluorescence of said liquid upon contact with said material.

68. (Currently amended) A method for routing a liquid comprising the steps of:

receiving said liquid on a patterned surface, said patterned surface comprises one or more hydrophobic portions confining a hydrophilic surface to form a pathway having an open architecture; and

individually activating one or more heating elements,

wherein said heating elements are in registry with said patterned surface for selectively heating said patterned surface under conditions effective for routing said liquid along said hydrophilic surface and flow of said liquid is by thermocapillary shear stresses and said liquid remains in constant contact with a gaseous phase.

69. (Currently amended) A device for routing a liquid comprising:

a patterned surface receiving said liquid, said patterned surface comprising one or more hydrophobic portions confining a hydrophilic surface to form a pathway having an open architecture;

one or more heating elements in registry with said patterned surface; and

means for individually activating one or more of said one or more heating elements, for selectively heating of said patterned surface under conditions effective for routing said liquid along said hydrophilic surface and flow of said liquid is by thermocapillary shear stresses and said liquid remains in constant contact with a gaseous phase.

70. (Original) A method for dividing a stream of liquid comprising the steps of:

receiving said stream of liquid on a patterned surface, said patterned surface comprises one or more hydrophobic portions confining a hydrophilic surface to form a pathway; and

individually activating one or more heating elements,

wherein said heating elements are in registry with said patterned surface for selectively heating said patterned surface under conditions effective for dividing said stream of liquid into one or more droplets.

71. (Original) A device for dividing a stream of a liquid comprising:

a patterned surface receiving said stream of liquid, said patterned surface comprising one or more hydrophobic portions confining a hydrophilic surface to form a pathway;

one or more heating elements in registry with said patterned surface; and

means for individually activating one or more of said one or more heating elements, for selectively heating of said patterned surface under conditions effective for dividing said stream of liquid into one or more droplets.

72. (Original) A method for mixing two or more liquids comprising the steps of:

receiving said two or more liquid, on a patterned surface, said patterned surface comprises one or more hydrophobic portions confining a hydrophilic surface to form a pathway, each of said liquids being received in one of said pathways, said pathways being interconnected; and

individually activating one or more heating elements,

wherein said heating elements are in registry with said patterned surface for selectively heating said patterned surface under conditions effective for mixing said two or more liquids in at least one of said pathways.

73. (Original) A device for mixing two or more liquids comprising:

a patterned surface, said patterned surface comprising one or more hydrophobic portions confining a hydrophilic surface to form a pathway, each of said liquids being received in one of said pathways, said pathways being interconnected;

one or more heating elements in registry with said patterned surface; and

means for individually activating one or more of said one or more heating elements, for selectively heating of said patterned surface under conditions effective for mixing said two or more liquids in at least one of said pathways.

74. (Currently amended) A method for detecting an airborne material in gaseous, particulate or aerosol form comprising the steps of:

providing a device comprising a substrate having a network of one or more surface pathways on an upper surface of said substrate, each said one or more surface pathways extending between a pair of reservoirs, said surface pathways being either (1) a flat topology with chemical patterning or (2) an indentation, ridge or groove ~~optionally~~ said indentation, ridge or groove having chemical patterning, a heat source coupled to a bottom surface of said substrate, a heat sink coupled to said bottom surface of said substrate opposite of said heat source;

applying a liquid to said network and allowing said liquid to flow by activation of said heating source, and flow of said liquid is by thermocapillary shear stresses and said liquid remains in constant contact with a gaseous phase;

applying said airborne material to said network; and

detecting said airborne material in said liquid.

75. (Original) The method of claim 74 wherein said heat source is positioned in registry with one or more source said reservoirs.

76. (Original) The method of claim 74 wherein said heat source comprises one or more heating elements.

77. (Original) The method of claim 74 wherein said airborne material is detected by liquid by becoming fluorescent.

78. (Original) The method of claim 74 wherein said airborne material is applied by a convective stream of said airborne material perpendicular to said one or more pathways.

79. (Currently amended) A device for detecting an airborne material in gaseous, particulate or aerosol form comprising:

a substrate having a network of one or more surface pathways on an upper surface of said substrate, each said surface pathways extending between a pair of reservoirs, said surface

pathways being either (1) a flat topology with chemical patterning or (2) an indentation, ridge or groove ~~optionally~~ said indentation, ridge or groove having chemical patterning, a heat source coupled to a bottom surface of said substrate, a heat sink coupled to said bottom surface of said substrate opposite of said heating source;

applying a liquid to said network and allowing said liquid to flow by activation of said heating source, and flow of said liquid is by thermocapillary shear stresses and said liquid remains in constant contact with a gaseous phase;

means for applying said airborne material to said network; and

means for detecting said airborne material in said liquid.

80. (Original) The device of claim 79 wherein said heat source is positioned in registry with one or more source said reservoirs.

81. (Original) The device of claim 79 wherein said heat source comprises one or more heating elements.

82. (Original) The device of claim 79 wherein said airborne material is detected by liquid by becoming fluorescent.

83. (Previously presented) The device of claim 79 wherein said airborne material is applied by a convective stream of said airborne material perpendicular to one or more said surface pathways.

84. (Canceled).

85. (Canceled).

86. (Canceled).

87. (Canceled).

88. (Canceled).

89. (Canceled).

90. (Canceled).

91. (Canceled).

92. (Canceled).

93. (Canceled).

94. (Canceled).

95. (Canceled).

96. (Canceled).

97. (Canceled).

98. (Currently amended) A method for storing a device, said device comprising a device for detecting an airborne material in gaseous, particulate or aerosol form including a substrate having a network of one or more surface pathways on an upper surface of said substrate, each said surface pathways extending between a pair of reservoirs, said surface pathways being either (1) a flat topology with chemical patterning or (2) an indentation, ridge or groove ~~optionally~~ said indentation, ridge or groove having chemical patterning, a heat source coupled to a bottom surface of said substrate, a heat sink coupled to said bottom surface of said substrate opposite of said heating source,

comprising the step of:

storing said device in glycerol.

99. (Currently amended) A method for storing a device, said device comprising a device for detecting an airborne material in gaseous, particulate or aerosol form including a substrate having a network of one or more surface pathways on an upper surface of said substrate, each said surface pathways extending between a pair of reservoirs, a heat source coupled to a bottom surface of said substrate, said surface pathways being either (1) a flat topology with chemical patterning or (2) an indentation, ridge or groove ~~optionally~~ said indentation, ridge or groove having chemical patterning, a heat sink coupled to said bottom surface of said substrate opposite of said heating source comprising the step of:

applying a layer of glycerol on said patterned surface.

100. (Canceled).

101. (Canceled).